**Structure of Southern Peru from Seismic Array Data Using Receiver Functions**

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**Abstract**

The subduction zone in southern Peru is imaged using converted phases from teleseismic P, PP, and PKP waves and P wave tomography using local and teleseismic events. The data come from three linear arrays which have a total of almost 100 broadband seismic stations. The first array (Line 1) spans 140 km from the coast (Ilo) to Lake Titicaca (Juliaca) and is located in the normal dipping subduction regime. The second array (Line 2) runs from Juliaca to Cuzco parallel to the seismic trench and samples the transition from normal to flat subduction regimes. The third array (Line 3) is parallel to Line 2 and runs from Nazca to Cuzco in the shallow subduction region. The Moho is observed at a depth of up to 75 km beneath the Altiplano. At the mid-crustal level of 40 km, there is a continuous structure with a positive impedance contrast, which we suggest is the western extent of the Brazilian Craton as it under-thrust by the Brazilian shield rather than delamination of lower crust through ecloginization. The results support a model of crustal thickening in which the margin crust is comes from three linear arrays which have a total of almost 100 broadband seismic stations. **Introduction and Methods**

- **Array Location**
  - The seismic array runs from the coast to Lake Titicaca (Juliaca) and is located in the normal dipping subduction regime. The array runs from Juliaca to Cuzco parallel to the seismic trench and samples the transition from normal to flat subduction regimes. The third array (Line 3) is parallel to Line 2 and runs from Nazca to Cuzco in the shallow subduction region. The Moho is observed at a depth of up to 75 km beneath the Altiplano. At the mid-crustal level of 40 km, there is a continuous structure with a positive impedance contrast, which we suggest is the western extent of the Brazilian Craton as it under-thrust by the Brazilian shield rather than delamination of lower crust through ecloginization. The results support a model of crustal thickening in which the margin crust is comes from three linear arrays which have a total of almost 100 broadband seismic stations.

- **Seismicity**
  - **Event Locations**
  - **Receiver Functions**
  - **Modeling Results**

- **Results**
  - **Line 1**
  - **Line 2**
  - **Line 3**

- **Implications**
  - **Uplift of Altiplano and Brazilian Shield Underthrusting**
  - **Flat Slab subduction and the Nazca Ridge**

- **Tomography**

**Figures**

Reference: